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A chemical study of the contents of an Early Dynastic Egyptian storage jar

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The Early Dynastic (sometimes the Archaic) period of ancient Egypt is here taken to be the first two dynasties of the Pharaonic time period (that is 3100 to 2686 BC).[1]

Pottery storage jars, of various shapes and sizes, have been found (sometimes in very large numbers) at several funerary (tomb) excavation sites of this period. Examples are the elite/royal tombs at Abydos and Saqqara (see Fig. 1) and the necropolis of Tarkhan (approx. 30 km south of Memphis).[2] These jars were made from clay; either the ubiquitous 'Nile silt' clay or the less common marl clay. The latter usually fired (in an oxidising atmosphere) to a white colour, and the former usually (again after firing in an oxidising atmosphere) to a red-brown/red colour (from the presence of the red iron oxide, Fe_2O_3) and so are often referred to as 'Red ware'.[3,4]

Fats and oils have been found in tomb storage jars; as have such materials as grains/grasses, wine, beer and resins. The fats/oils had various uses in both life and the afterlife of ancient Egypt, such as: a food, a cosmetic/medicinal ointment, as an illuminant, in the embalming process, and in temple/domestic rituals.[2,4,5]

Older chemical analyses (i.e. done between c.1880 and c.1940), using 'wet chemistry' analytical methods, on 'fatty matter' found in various tombs (sometimes in a jar and sometimes loose in the ground) often gave inconclusive or very general results. This was partly because of an often high degree of degradation in the samples and partly because of the limitations inherent in their analytical techniques.[5,6]

Some relevant examples of old Egyptian residues analysed by modern spectroscopic methods, often with information on probable usage, will be mentioned in the later Discussion section.

Sample and Analytical Methods

A few years ago an ancient Egyptian storage jar, forming part of the collection of the Egypt Centre of Swansea University's Museum of Egyptian Antiquities (Wales, UK), unfortunately fell whilst being transported a short distance. Part of the top and side of the jar broke off and revealed a large amount of a yellow-brown sticky semi-solid with no obvious odour. Over time the (new) surface material slowly darkened in colour and hardened (see Fig. 2). Before this happened we removed some material from below its surface for later chemical analysis.

The storage jar has been dated to the Early Dynastic period, and although its exact provenance is unknown it is thought that it was possibly originally a funerary item. It is red in colour and 45.5 cm in height. It has a maximum width of 17 cm (at a height of 29.5 cm), and tapers to a flat base of 6 cm in width. No incised marks or images ('potmarks') have been found on its surface.

The analytical techniques used by us on the removed material were: LVSEM (Low Vacuum Scanning Electron Microscopy), GC-MS (Gas Chromatography-Mass Spectrometry) and GC-C-IRMS (Gas Chromatography-Combustion-Isotope Ratio Mass Spectrometry). The first technique gives an analysis of the elements present (down to and including an atomic number of 6, i.e. carbon), and the second and third techniques give data on the organic compounds present.[7,8]

Results

Some initial work was done on the material/sample using the techniques of **GC-MS** and optical microscopy. The former only gave data that indicated the sample was a degraded fat or oil. The latter showed the presence of a body hair from a small mammal (i.e. mouse, rat or perhaps cat) and some distinctive phytoliths (literally 'plant stones'). Phytoliths are microscopic opaline (i.e. $SiO_2.nH_2O$) bodies deposited in plants; and it is possible to assign ones of a particular shape to a plant family, genus or even species. Small quantities distinctive to barley or emmer wheat were found, and larger amounts of dumbbell-shaped ones which indicated the presence of the monocotyledonous (monocot) grass family.[9]

The **LVSEM** results on the sample, in decreasing order of elemental weight percent (where the elements given in brackets are each present at less than 1%), were: C, O, Si, Al, Ca, Fe, K (S, Mg, Ti, Zn, Na).

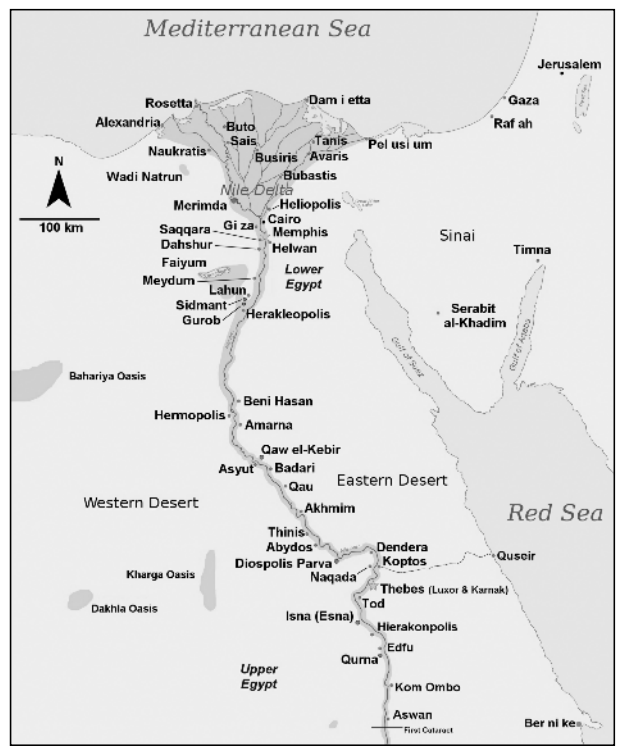

Figure 1. Map of ancient Egypt.
(After: Jeff Dahl, Wikimedia Commons)

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Figure 2. The opened Early Dynastic Egyptian jar. (© University of Wales at Swansea, Egypt Centre)

GC-MS: After a derivatisation of some of our sample one analysis was done. The results are summarised below, with additional data given in the Endnote.[10]

Fifteen of the thirty compounds identified were saturated straight-chain carboxylic acids (C6/7/8/9/10/11/12/13/14/15/16/17/18/19/20, to a total of 81%) and where the palmitic (C16:0) and stearic (C18:0) acids had the highest amounts present (41.7% and 25.1% respectively). Additionally there were: seven dicarboxylic acids (C4/6/7/8/9/10/11, to a total of 7% and where the C9:0 diacid has the largest amount – at 3.1%); three oxo-/hydroxy-/dihydroxy- derivatives of several saturated fatty acids (to a total of 1.1%); one branched-chain saturated fatty acid (C17:0, at 0.8%); two straight-chain alcohols (C8 and C9, to a total of 0.2%) and two mono-terpene ketones (nerylacetone and geranylacetone, to a total of 0.8%).

GC-C-IRMS: After a separate and different derivatisation of some of our sample (see Endnote[10] for additional information) one analysis was done and the results were:

δ^{13}C16:0 –24.759 ‰ (per mille);
δ^{13}C18:0 –24.191 ‰;
$\Delta\,\delta^{13}$(C18:0 – C16:0) +0.568 ‰ .

Discussion

Our LVSEM data show that the sample's largest percentage elements are carbon and oxygen (to a total of 82%). The remaining, mostly inorganic, elements are assumed to come from small broken fragments of the jar (and some of the silicon found to be from the phytoliths).

The most recent GC-MS data shows *no* evidence for the presence of wax (e.g. beeswax) or plant resin (e.g. pine resin) in our sample. It *does* show evidence for the presence of fat/oil. The main components of fats and oils are triacylglycerides (TAGs), where each molecule is an ester of glycerol and three carboxylic (fatty) acids. These acids are of variable (carbon) chain length and can be saturated or unsaturated. In *old* fats and oils these TAG molecules are often substantially hydrolysed to their component fatty acids (FAs). Such 'free' acids dominate in our GC-MS data; thus suggesting the presence in our original sample of a fat/oil. Also, these FAs (and the TAGs prior to hydrolysis) can be subject to oxidation, and degraded by any bacteria/microbes that may be present.

Our sample is assumed to have been in a warm (possibly hot) and dry environment for approx. 5000 years. Thus a degree of oxidation of the sample is to be expected from atmospheric oxygen, and any hydrolysis would be from the water which was part of the original sample and also perhaps from the local environment, both increasing once the jar's content was open to the atmosphere.

Oxidation products were found, the GC-MS data giving: a range of short carbon-chain dicarboxylic acids (C4:0 and C6:0 to C11:0, with a maximum at C9:0), and oxo-/hydroxy-/dihydroxy- derivatives of several saturated FAs. Dicarboxylic acids are formed by the oxidative cleavage of a carbon-carbon double bond of a longer carbon-chain FA. The predominance of the C9:0 dicarboxylic acid (and the presence of some mono-carboxylic C9:0 acid) suggests a 'parent' of oleic acid (C18:1). We have ten oxidation products, to a total presence of 8.1%. Unsaturated FAs degrade faster than the saturated ones, and in our sample – as might be expected given its age – we have not detected any unsaturated fatty acids.

Our pattern of FAs suggests the presence of an *animal adipose fat,* that is palmitic acid (P, C16:0) *and* stearic acid (S, C18:0), being present in significant and similar amounts (i.e. a few tens of percent each) and smaller amounts (i.e. usually under 2% each; with only C14:0 and straight chain C17:0 above this value at 5.3% and 2.9% respectively) of other saturated FAs. The presence of C9:0 has already been explained, and the presence of small amounts of other *odd*-numbered FAs (especially: C15:0, straight chain; C17:0, straight and branched chain and C19:0, straight chain) are also suggestive of the presence of an animal fat.[11,12,13]

A more detailed study of our GC-MS data and the calculation of various FA ratios *may* help to distinguish ruminant from non-ruminant fat. The ratios used below, and their various discriminatory values, are ones using only saturated acids. The 'degree of robustness' of various FA ratios have been widely discussed, and so their results should be used (cautiously) as 'indications' of what was present originally. If at all possible they should be used in conjunction with additional information.[12,13]

Perhaps the most well known FA ratio is Palmitic acid/Stearic acid (P/S, C16:0/C18:0). A 'cut-off' value of 1.3 is often used, where P/S > 1.3 suggests a non-ruminant fat and < 1.3 a ruminant fat. Our ratio is 41.7/25.1, giving 1.7 and so indicating a non-ruminant fat (often taken to be pig fat).[11,12]

A second FA ratio is in fact a combination of two ratios: Stearic acid/Palmitic acid (S/P) and C17:0 br. (branched-chain)/C18:0. If S/P > 0.5 then (terrestrial) animal fat is suggested (if < 0.5 then plant oil or marine animal fat is suggested). If C17:0 br./C18:0 is < 0.02 then

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non-ruminant fat is suggested and if > 0.02 suggests ruminant fat. Our values are: S/P = 0.6 and C17:0 br./C18:0 = 0.03; which indicates a ruminant fat.[14]

Our last ratio is one combining six FAs. If the ratio (C15:0 + C17:0)/(C12:0 + C14:0 + C16:0 + C18:0) is > 0.04 then ruminant fat is suggested and if < 0.04 then non-ruminant fat. Our value is 0.05, and so indicates once more a ruminant fat.[15]

Assessment of results

Thus, *overall* from these FA ratios, there is one indication for the presence of non-ruminant fat and two indications for ruminant fat. Reasons for this variation in 'indications' of the type of fat present are often stated to be one or both of the following:

A) a minor component of a different fat, some vegetable oil or perhaps a small amount of (degraded) plant material is present, and

B) the diet of the animal whose fat is present deviated from the assumed 100% C3 diet. Where a C3 diet consists of cereals (such as rice, wheat, barley, rye and oat) and/or of most of the plants that grow in temperate regions. A C4 diet would be from plants that grow in hot moist or arid non-saline regions; such as some monocot grasses, maize, millet and sorghum.[8]

The results from FA ratios should ideally be combined with additional (analytical) information, and the technique often used is GC-C-IRMS. The values from this analytical technique for an unknown fat-containing residue are compared to values from modern-day reference fats in order to identify the unknown fat. Pioneering work at Bristol University (UK) in the 1990s established that it was possible to distinguish fats of different biological origins by measuring the carbon stable isotope (i.e. ^{13}C vs ^{12}C) ratios, expressed as $\delta^{13}C$ values, of the FAs (fatty acids) C16:0 and C18:0. Data from an unknown fat-containing sample can then be compared to reference values obtained from various modern fats, and thus often be identified. This reference data, enclosed within confidence ellipses for each type of fat, is placed on a plot of $\delta^{13}C18{:}0$ against $\delta^{13}C16{:}0$. The number of reference ellipses have increased from three (non-ruminant/porcine adipose fat, ruminant adipose fat and ruminant dairy fat) to include other types of fat in their own ellipses, such as: equine adipose, equine milk, freshwater fish, seawater fish, duck/fowl, goose, and some wild animals (e.g. wild boar). Thus there is now sometimes a small degree of overlap between some of the reference ellipses.[8]

We have compared our data to several such reference plots, where in each the animals were raised in (northern) Europe and fed a strictly 100% C3 diet. Our values were found to be within the confidence ellipse for porcine adipose fat.[8,16,17] However, this ellipse has a small degree of overlap with the ellipse for marine (seawater) fish. The (molecular) 'bio-markers' for marine fish are: significant amounts of the long-chain saturated FAs C20:0, C22:0 and C24:0; some specific isoprenoid FAs (e.g. phytanic acid) and a range of specific cyclic compounds that are degradation products of long-chain (i.e. greater than C20) polyunsaturated FAs.[8,16] For our sample only a small amount of C20:0 was found (of 0.6%) and *none* of the other compounds listed above.

Additionally, $\Delta\ \delta^{13}(C18{:}0 - C16{:}0)$ can be plotted against $\delta^{13}C16{:}0$. Three (horizontal) 'bands' were generated using reference data and these are (with the approx. numerical ranges given in brackets): the most negative values for ruminant dairy fat (-6 to -3); less negative values for ruminant adipose fat (-3 to -1) and mostly positive values for pig adipose fat (-1 to +2). Also, variations in the value of $\delta^{13}C16{:}0$ can be related to deviations from the assumed 100% C3 diet to a diet that included some C4 content and/or to the presence of C4 plant material in the sample.[8,17]

Our $\Delta\ \delta^{13}(C18{:}0 - C16{:}0)$ value of +0.568 ‰ is in the adipose pig fat 'band'; and our $\delta^{13}C16{:}0$ value indicates a small shift towards a C4 diet *and/or* the presence of C4 plant material in our sample (e.g. C4 monocot grass).

Comparison with other residues

Some examples of the analysis of residues containing fats/oils, using modern analytical techniques and where the residues are from various Egyptian locations and time periods, will now be considered. In most of them the intended usage of the original sample is known or can be deduced/speculated upon from the provenance and from what other substances are found to be present in the residue. Also, some relevant textual and visual evidence will be mentioned.

A. One example of such an analysis, where the original use is known, is the study of the residues of illuminants in archaeological lamps. Ten such lamps were excavated at Qasir Ibrim, an Egyptian-Nubian site approx. 240 km south of Aswan (see Fig.1) and where what remains of it is now located on a headland in Lake Nasser, and dated to the Christian period of occupation (i.e. 600 to 1500 AD). Various specific oils were identified – *Brassicaceae* seed oil, castor oil and possibly also linseed or sesame oils. These findings are consistent with their mention, as illuminants used in Egypt, by the classical writers, such as: Diodorus (active first century BC), Herodotus (c.485–425 BC), Pliny the Elder (23–79 AD) and Strabo (c.63 BC–21 AD). Fats, both ruminant and non-ruminant, were also probably present and it is thought they were mixed with an oil when present.[4,18]

B. Another example of known usage residues is material taken from the wrappings of an embalmed/mummified body. Until very recently it was thought that the use of chemical substances (such as fats, oils, resins, waxes etc) in the embalming process only started in c.2200 BC (i.e. late Old Kingdom). A recent article has shown that an early form of 'chemical embalming' started approx. two millennia earlier. Samples variously (radiocarbon) dated to between c.4300 and c.2900 BC (i.e. Badarian to Early Dynastic), and taken from the linen wrappings covering bodies in pit graves at Mostagedda, were analysed. Mostagedda is a few km north, along the east bank of the Nile, from Badari (see Fig.1). An animal fat and/or vegetable oil was found, as a major component, in all of the samples analysed. Additional substances found in the (16) samples were (with the number of samples where

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each was found given in brackets): plant wax (8), pine resin (10), aromatic plant extract (16), sugar/gum (16), and natural petroleum seep (13). Unfortunately the fats/oils could not be reliably individually identified.[19]

C. Residues from four blue-glazed faience jars, each bearing the cartouche of Rameses II (reigned 1279 to 1213 BC[1]), were analysed using GC-MS and LC (Liquid Chromatography) -MS. Additionally, two of the samples were radiocarbon dated and analysed by GC-C-IRMS. Each jar had some yellow-brown residue on its inner wall, and one jar contained an impregnated piece of linen. Also, an orange-yellow 'resin-like' substance was available for study, where it was originally associated with a package (since lost) found in one of the jars. One wall residue was dated to the Third Intermediate Period (1069–747 BC[1]), and was found to have an animal (probably pig) fat as its major component and an oil (possibly coniferous) as its minor component. The piece of linen and the other jars' wall residues were all found to have compositions similar to that of the wall residue described above. The 'resin-like' substance was dated to the Ptolemaic Period (332–30 BC[1]), and found to be tree (probably *Pistacia*) resin. It was thought by the authors that the wall residue in each jar was an unguent for use in worship, possibly being stored in the temple for later use. The 'resin-like' substance was thought to be an embalming material; so suggesting that the jars were later re-used for storage of embalmed viscera.[20]

D. Eight First Dynasty (3100–2890 BC[1]) jars, found in the NW chamber of the tomb of Djer (reigned c.3000 to c.2980 BC[1]) at Abydos (see Fig. 1), had their contents analysed by GC-MS and FTIR (Fourier Transform Infra-red Spectroscopy). Six of the jars were foreign-made (in the Levant; modern-day Lebanon/Palestine) and two were made in Egypt (of 'Nile silt'). One of the foreign jars was broken in the past and subsequent restoration/re-construction is thought to have probably contaminated its contents. Also, the tomb suffered burning in the distant past and some of the jars show evidence of being badly burnt; this may have adversely affected the jars' contents. In two of the five (unrestored) foreign-made jars only vegetable oils were detected; for the other three jars various additional materials were found which suggested the contents were generally consistent with being food mixtures. The two Egyptian-made jars (both described as 'globular pottery jars') were thought to both contain animal fat, one with some additional proteinaceous matter. This second jar's residue gave a P/S value of 1.7; though interpreting it should be done very cautiously, especially given the above burning and additional material found.[21]

E. The final example of residue analysis involved samples taken from four individual solid masses, part of a collection of such solid masses (in the Petrie Museum of Egyptian Archaeology, London, UK), but unfortunately with no secure provenance to specific containers or where found --- only labeling saying they all had been removed from First Dynasty jars. The four samples were analysed using GC-MS and the results indicated that each was most likely either an animal fat or a mixture of animal fat and a vegetable oil.[22]

Textual evidence for the use of pig fat in medical recipes of ancient Egypt can be found in the Ebers papyrus. Whilst oxen (sometimes given as bull) and goose fats are the most quoted (50 and 46 respectively); pig fat is quoted, but only three times.[20] It is listed as one of the animal products used for the treatment of coughing (ingested), and as one component of a topical treatment for troublesome eyelashes.[23] It was also used as a basis for a fragrant unguent/cosmetic ointment; a recipe is given by Dioscorides (c.40–c.90 AD) where goose or pig fat was mixed with various herbs and some old wine, then boiled and cooled several times before being sieved through clean linen.[20]

Animal husbandry involving pigs can be traced back to c.3500 BC in Egypt. Faunal remains, isotopic analysis of human and animal bone collagen to determine diet, and tomb artefacts (such as clay models of the pig and a glazed figure of a sow, dated to the Predynastic and First Dynasty respectively) show that pigs were domesticated and being eaten in the Early Dynastic period.[4,24,25]

Using the above information it can be seen that animal fat was variously used in ancient Egypt. The specific use(s) of pig fat is less certain, but it *could* have been used in all the previously mentioned examples. Usually this would have been as part of a mixture; using it by itself (or perhaps just lightly scented) restricts its possible applications. We would suggest as a food (perhaps on bread) or as a skin emollient against the effects of the hot climate.

Conclusions

Our Early Dynastic storage jar, possibly funerary in origin, originally contained non-ruminant, very probably porcine, adipose fat. There is some evidence for the presence of a small amount of monocot grass(es), possibly added in an attempt to scent and/or preserve the fat, or possibly just present from prior usage of the jar.

There is, as expected for a material that is approx. 5000 years old, a significant degree of hydrolysis and oxidation, perhaps where some had occurred relatively recently. Ten of the thirty molecules found (to a total presence of 8.1%) from our GC-MS analysis were recognisable oxidation products of a fat.

The *exact* provenance, and intended usage of the contents, of our storage jar is unknown. The provenance *could* be funerary and the usage any of the ones previously mentioned (food, cosmetic/medicinal, illuminant, embalming, and temple/domestic rituals). The most likely uses for our jar's contents *alone* could be, in life or the afterlife, as a food or as a cosmetic/medicinal emollient.

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project, and providing the sample and an image of the storage jar (Figure 2); the staff of the Chemical and Materials Analysis Unit (University of Newcastle, UK) for the experimental LVSEM work; and Quest (Quaternary Scientific; at the University of Reading, UK) for carrying out the GC-C-IRMS measurement.

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A 'C' followed by a number gives the total number of carbon atoms in the compound, and for fatty acids (FA, variable carbon-chain length carboxylic acids) the number after the colon gives the number of double bonds between carbon atoms in the molecule. Fatty acids with no double bonds between the carbon atoms are termed saturated, and those with double bonds unsaturated. Also given for the GC-MS data, after this abbreviated formula (and sometimes also its chemical name/formula), is its percentage present.

GC-MS and GC-C-IRMS: These analyses were each done using well-established protocols. Further information on both these techniques can be found in references 7 and (especially for GC-C-IRMS) ref. 8. Further technical details on these two techniques and on *our* experimental details (in addition to those given below) can be obtained by contacting an author (PF).

For the GC-MS analysis some of the sample was subjected to extraction in a mixture of toluene and methanolic potassium hydroxide, followed by derivatisation with N-methyl-N-(trimethylsilyl)trifluoroacetamide. This procedure is designed to produce methyl esters of esterified fatty acids and trimethylsilyl ester derivatives of free fatty acids. In our analysis the latter derivatives were found to predominate.

Later some of our sample was separately derivatised by acid-catalysed methyl esterification and the relevant FA derivatives were used for the GC-C-IRMS measurement; which was carried out on a Thermo Fisher GC (Gas Chromatography) Isolink-Delta V Plus Isotope Ratio MS (Mass Spectrometer), calibrated by running C16:0 and C18:0 FAMES (fatty acid methyl esters) prepared from solid C16:0 and C18:0 fatty acids whose $\delta^{13}C$ values were measured on a SerCon Europa 20-20 continuous flow isotope ratio mass spectrometer. The estimated precision of each of our two values is ± 0.3 ‰.

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Major Accessions to Repositories in 2015 Relating to Pharmacy and Chemistry

(provided by the National Archives)

Local

City of Westminster Archives Centre, 10 St Ann's Street, London SW1P 2DE Reece family, pharmacists, Piccadilly: legal case papers c1970-2000 (2849)

Cumbria Archive Centre, Carlisle, Lady Gillford's House, Petteril Bank Road, Harraby, Carlisle, Cumbria CA1 3AJ Ridley's, chemist, Carlisle: prescription books, recipe books and financial records 1865-1973 (DB 179); Joseph Wilson, pharmacist, Penrith: records incl recipe book 1854-1979 (DB 180)

Explore York Libraries & Archives, York Explore Library Learning Centre, Museum Street, York YO1 7DS Bleasdale Ltd, manufacturing and wholesale chemists, York: staff photographs c1920-1969 (BLE)

Sheffield City Archives, 52 Shoreham Street, Sheffield S1 4SP John Acton, chemist and druggist, Sheffield: daily journal 1836-1838 (2015/53)

West Sussex Record Office, 3 Orchard Street, Chichester, West Sussex PO19 1DD Chemist, Bognor Regis: prescription ledgers, customers (incl Dante Gabriel Rossetti) 1875-1976 (18025)

Wigan Archives Service, Leigh Town Hall, Civic Square, Leigh, Wigan WN7 1DY Wallwork, pharmaceutical chemist, Tyldesley: prescriptions notebook with customer details 1878-1880 (Acc. 2015/95)

National

Jersey Archive, Jersey Heritage Trust, Clarence Road, St Helier, Jersey JE2 4JY, Channel Islands Royal Pharmaceutical Society of Great Britain, Jersey branch: minutes 1939-1980 (JA/2691)

Royal Botanic Gardens, Kew, Library and Archives, Kew, Richmond, Surrey TW9 3AE England Nigel Veitch (1965-2014), plant chemist: papers and scientific research [restricted access] 1988-2006 (PrP 15-0013)

University

University of Manchester Library, The John Rylands Library, 150 Deansgate, Manchester M3 3EH Samuel Davies, chemist and druggist, Chester: records of chemical experiments and analysis of water samples 1822-1855 (Acc 2015/31)

Sheffield University Library, Western Bank, Sheffield S10 2TN Sir Harold Walter Kroto (b 1939), chemist and Nobel Prize winner: personal papers incl corresp, journal articles, offprints, research notes and examples of graphic designs c1950-2015 (MS 455)

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Wines as pharmaceutical dosage forms in '*Amal Saleh*', the last Persian pharmacopoeia in the Zand era

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Introduction

Prescriptions to prepare compound drugs date back to antiquity.[1] Previous publications on Persian pharmaceutical preparations outlined the history of Persian 'pharmacopoeias', the *Qarabadins* that listed drugs, dosages, and various pharmaceutical considerations.[2] In this paper, we consider examples of wines and tinctures from one of the last Persian pharmacopeias, namely *Amal Saleh* or *Qarabadin Salehi* (Figure 1).[3] Wines and tinctures with an alcoholic basis are a group of preparations with a long history and varied therapeutic uses as antidotes,[4] haematopoietics,[5] preventing seasickness,[6] anaesthetics, analgesics, emetics, digestives, etc.[7] In Persian medicine, such preparations were called *sharab,* meaning wine.

Amal Saleh (*Qarabadin Salehi*)

Amal Saleh or *Qarabadin-e-Salehi was authored* by Mohammad Saleh Ghaeni Heravi in 1766 AD. Written in the time of the Zand dynasty (1750-1794), it was comprehensive and well compiled such that, today, it still has a place in the field of traditional pharmacy in Iranian universities. It serves as an example of literature prior to the gradual replacement of traditional medicine and pharmacy by Western medicine.[8] It contains more than 200 pharmaceutical dosage forms arranged alphabetically, accompanied by their preparation methods and pharmaceutical considerations.[3,9]

Wines (*Ashrabeh*) as a dosage form in *Amal Saleh*

There is a chapter on *Ashrabeh* (drinks and wines) in *Amal Saleh* which defines *Sharab* (wines in the Persian language) as 'grape juice that was boiled by itself and its sweetness removed'; it is a synonym of *khamr* (alcoholic beverage or wine in Persian and Arabic). Physicians also used this term for all kind of syrups obtained from flowers, leaves, fruits, seeds, branches and roots.[3]

Heravi described the procedures of making these syrups based on the plant parts. In the preparation of them, they would be boiled with a large amount of sugar, cube sugar or honey.[3] These ingredients can act as preservatives in liquid preparations.[10,11] It is mentioned in *Amal Saleh* that the shelf lives of these drinks (non-alcoholic ones) are about 3 years.[3]

Many formulations of wines are described by Heravi in *Amal Saleh* and some of the types of wines are presented in Table 1. Information on plants used in these formulations is shown in Table 2.

Comment

Drinking alcoholic drinks was strongly prohibited in Islamic culture.[12] Although alcoholic beverages are permitted for medical uses by Islam, a reluctance to use them continues.[13] The comprehensive chapter on wines in *Amal Saleh* points to the status of physicians and pharmacists and their freedom of action to prepare and use alcoholic drinks for medical purposes.

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Figure 1. The first page of the chapter on *Asharabe* (wines and drinks) in a lithograph copy of *Amal Saleh*, written in 1766 AD.[3]

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Table 1. Some examples of medicinal wines in *Amal Saleh.*

Name of wine	Preparation Method	Medical Use	Dose
Grape Wine	Five *man*[*] of ripe Grape juice should be filtered and boiled slowly. Then, the seed of Turnip, Arugula, Indian ginseng, Mediterranean needle-grass, Asparagus, Ash, seed of Sickle senna, seed of Carrot and Colchicum (of each 5 *dram*[**]), should be crushed partially and put in a bag and be prepared according to the method below.	Aphrodisiac, fattening agent	10 *dram*
Pokhte Joush (Cooked Boiled) Wine	Grape juice (100 *man*), some Mint and a bag containing partially crushed parts of lamb (20 *dram*); Agarwood (10 *dram*); Saffron, Mastic resin, Lesser galangal and Nutmeg (of each 5 *dram*); Clove, Bitter ginger, Chufa sedge (of each 3 *dram*); and Chinese cinnamon, Ginger, Cinnamon, Pellitory and Valerian (of each 1 *dram*) should be put in a pot and boiled. Press the bag by hand in boiling liquid until the lamb be well cooked and the mixture has thickened. After filtering the mixture, the procedure should be repeated several times. Then, 2 *dang*[***] of Musk, 1 *dram* of Ambergris and 1 *ratl*[****] of Rose water should be added to the mixture and be cooled and kept in chinaware or glass vessels.	Aphrodisiac, fattening agent, stomach and liver tonic, analgesic for joint and back pains, beneficial for cold disorders like paralysis and tremor, skin whitening and refresher, diuretic	10 *dram*
Another *Pokhte Joush* (Cooked Boiled) Wine	Sweet grape juice (100 *man*); and a bag containing partially crushed parts of lamb (20 *man*); Indian Agarwood (10 *dram*); Saffron (5 *dram*); Clove and Nutmeg (of each 3 *dram*); Mastic and Lesser galangal (of each 5 *dram*); Chinese cinnamon, Cubeb, Bitter ginger, Cardamom, Chufa sedge, Ginger, Cinnamon, Pellitory and Valerian (of each 1 dram) should be put in a pot and boiled until it be well cooked. The next step is like to *Pokhte Joush* (Cooked Boiled Wine, above). Then, Rose water (1 *ratl*) and Honey (10 *ratl*) should be added to the filtrate mixture and be boiled and any foam removed. Then, pure Musk (1 *dram*) and Saffron (2 *dram*) should be added and be cooled.	Aphrodisiac; stomach, liver and kidney tonic; diuretic; analgesic for joint and back pains; beneficial for paralysis, tremor and amnesia; memory booster; skin whitening; breath freshener; carminative and beneficial for geriatrics.	1.5 *oghieh*[*****]
Triangle Wine	A Grape juice that is boiled and two-thirds evaporated off.	Aphrodisiac for patients with 'cold' temperament (it is not good for hot persons); haematopoietic; digestive tonic; beneficial for the patients of smallpox, typhoid fever, pleurisy and pneumonia	It is not given in *Amal Saleh*

Weights and measures used in medieval Persia

* One *man* = 835.2 gram
** One *dram* 3.2 gram.
*** One *dang* = 250 milligram.
**** One *ratl* = 414 gram.
***** One *oghieh* = 34.5 gram.

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Table 2. Names of the plants mentioned in this paper.

Persian Name	English Name	Scientific Name	Family
Ood	Agarwood	*Aquilaria sinensis* (Lour.) Spreng.	Thymelaeaceae
Zafaran	Saffron	*Crocus sativus* L.	Iridaceae
Lesan al-Asafir (Zaban Gonjeshk)	Ash	*Fraxinus excelsior* L.	Oleaceae
Shalgham	Turnip	*Brassica rapa* var. *rapa* L	Brassicaceae
Jerjir	Arugula [rocket]	*Eruca sativa* Mill.	Brassicaceae
Boozidan	Indian ginseng	*Withania somnifera* (L.) Dunal	Solanaceae
Bahmanin	Mediterranean needle-grass	*Stipa capensis* Thunb.	Poaceae
Heliun (Marchube)	Asparagus	*Asparagus officinalis* L. 1753	Asparagaceae
Angoor	Grape	*Vitis* spp. L.	Vitaceae
Gelghel	Sickle senna	*Cassia tora* L.	Fabaceae
Kazar (Havij)	Carrot	*Daucus carota* subsp. *sativus* (Hoffm.) Schübl. & G. Martens	Apiaceae
Souranjan	Colchicum	*Colchicum autumnale* L.	Colchicaceae
Na'na	Mint	*Mentha* x *piperita* L.	Lamiaceae
Jows-e-booya	Nutmeg	*Myristica fragrans* Houtt.	Myristicaceae
Khoolanjan	Lesser galangal	*Alpinia officinarum* Hance	Zingiberaceae
Mastaki	Mastic	*Pistacia lentiscus* L	Anacardiaceae
Gharanfol	Clove	*Syzygium aromaticum* (L.) Merrill & Perry	Myrtaceae
Zaranbad	Bitter ginger	*Zingiber zerumbet* (L.) Roscoe ex Sm	Zingiberaceae
So'd	Chufa sedge	*Cyperus esculentus* L.	Cyperaceae
Salikheh	Chinese cinnamon	*Cinnamomum cassia* (Nees & T.Nees) J.Presl	Lauraceae
Zanjebeel	Ginger	*Zingiber officinale* Roscoe	Zingiberaceae
Darchini	Cinnamon	*Cinnamomum verum* J.Presl	Lauraceae
Aghergherha	Pellitory	*Anacyclus pyrethrum* (L.) Link	Asteraceae
Sonbol al-Tib	Valerian	*Valeriana officinalis* L.	Caprifoliaceae
Gol (Vard) e Sorkh (Ahmar)	Rose	*Rosa damascena* Mill.	Rosaceae
Kababeh	Cubeb	*Piper cubeba* L.f.	Piperaceae
Hel	Cardamom	*Elettaria cardamomum* (L.) Maton	Zingiberaceae

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‘Common Sense Medicine’ and Health Advice

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Prologue

This article is intended to prompt discussion on the ways ‘common sense’ has been, and is, used in health care.[1] Over time, innumerable references to it range from describing positively a ‘natural’ or ‘simple’ remedy to its lack among those health care professionals who, seemingly, rely only on technology. In contrast, a so-called ‘common sense’ practice may be dismissed because of (a) lack of scientific evidence, (b) contradictions when distinctly different ‘common sense’ remedies are recommended for one and the same condition, or (c) links to, for instance, a new fashion, or a ‘gullible public.’

Hopefully, this outline of diverse ways common sense has been used within health care literature since the seventeenth century may prompt critical reflection on current usages. In turn, this may facilitate dialogues with patients who accept, often uncritically, any advice labelled as common sense. This suggestion reflects my experiences in North America and comments heard in the UK that many pharmacists, despite courses in self-care, lack either the knowledge or know-how to discuss with customers/patients many over-the-counter preparations, certainly homoeopathic, herbal and other ‘supplements’. Frequently, advice is little more than relaying database information on potential side-effects and drug interactions. Absent is that part of individualised care which is dependent on appreciating patients’ attitudes and the sources of information behind their questions.

Possibly, too, my account might contribute to discussions on the challenging task of exploring history of pharmacy with students who so often view history as of no practical value. How much focus should there be on teasing out themes which even the sceptic may see as having some relevance to quality patient-centred care?

Box 1 lists examples from the innumerable recent writings extolling ‘common sense’ practices.

Need for clarification

Unfortunately, health advice rarely, if ever, clarifies the precise meaning when describing a practice as ‘common sense,’ the same applies to such expressions as ‘good sense,’ ‘natural sense,’ or ‘common wisdom’. Some meanings found in the older literature are virtually obsolete – for instance, knowledge gathered through the various senses – and are not to be confused with those that remain current, for instance, ‘thinking and behaving in a reasonable way’, ‘average understanding’, ‘natural intelligence’, or ‘self-evident truths’.[2] Yet, subjectivity exists in all the definitions, and it is perhaps easier to say what common sense is not, as in this 1912 cartoon by W Heath Robinson offering a satirical comment on the then current promotion of exercise for health (**Fig. 1**).

Box 1. Illustrative titles of ‘common sense’ books and websites available 2016.

Promotion of complementary/alternative practices (CAM):

Common Sense Medicine: A Medical Doctor’s Prescription for Health Care (2000) [Experiences with alternative treatments];

Common Sense Health through Cleansing, Regulating & Rejuvenating (2001);

Naturally Healthy Babies and Children: A Commonsense Guide to Herbal Remedies, Nutrition and Health (2003);

C*ommon Sense Health: Detox, Diet and Physical Activities* (2013); [Detox. diet and physical actions used by holistic practitioners such as ‘oil pulling and barefoot therapy.’]

Others, some with a sense of integrating conventional healthcare with CAM:

Sleep. The Common Sense Approach (1998);

Common Sense PREGNANCY: Navigating a Healthy Pregnancy and Birth for Mother and Baby (2015);

The Common Sense Guide to Dementia for Clinicians and Caregivers (2013);

Good Medicine. A Return to Common Sense (2009) [‘Attain a Healthier You – Naturally – with this Breakthrough and Doctor-Proven Guide.’];

Common Sense Family Doctor [website: unclear what is meant by common sense, offers general discussions on, for instance, should women have mammograms before age 50?];

Common Sense in Medicine [website for integrating the medical model and holistic medicine.]

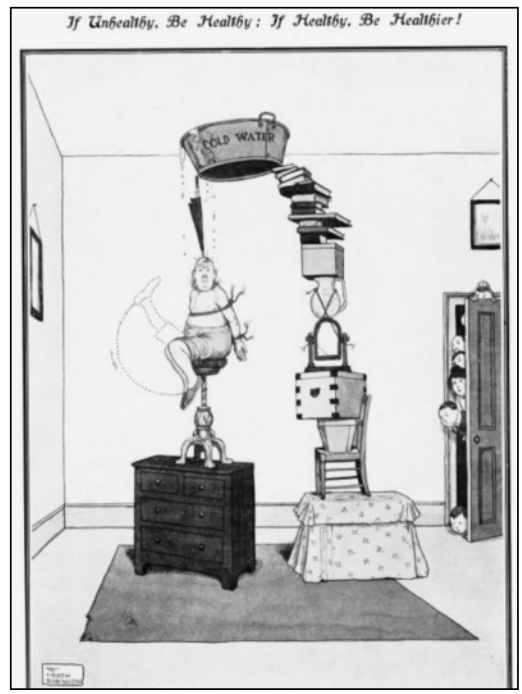

Figure 1. ‘Keep Fit Exercises: III. The Balance. The Tub Exercise for the Nervous. The right and the left legs to be raised *alternately*.
(W Heath Robinson: *The Sketch*, April 3, 1912, p. 403.)

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Philosophers have long held lengthy debates, albeit invariably without reference to health care, on the role of common sense in people's beliefs and knowledge. Nicholas Rescher's classification, which offers three meanings, is adapted in this paper:[3]

(i) *Observational common sense* that can be said to be linked to judgments about 'truths' based on personal, perhaps untutored observation(s).

(ii) *Judgmental common sense* for observations/ experiences that fit with or are rationalised by a current theory, concept, fashion, or tradition, but not one universally accepted. Lastly,

(iii) *consensual common sense* to describe a generalisation that fits a virtually universally held theory. However, such a classification cannot be written in stone. Consensus common sense, for example, may become judgmental as a new theory replaces an existing one. Further, outside Rescher's classification, health advice references to 'common sense' may also be used (a) by an author when 'simplifying' the complexity of medicine, often by omitting theory; (b) when current professional standards or guidelines are followed, even if they are questioned, to avoid trouble; and (c) rhetorically to imply, often misleadingly, self-evident truths.

17th to 18th centuries: shifting common sense

Although various sixteenth- to early seventeenth-century authors made clear, at least implicitly, that multiple experiences were a core element of medical practice, a common sense decision could be based on limited personal observations, certainly among the public. One senses from many manuscript recipe books that testimonials for a single positive outcome often carried weight, while William Vaughan, a lay author of a successful health advice book, wrote (1600) that he did not need to explain a particular treatment regimen, since 'that which is openly seene with eyes, need no proofes'.[4] This is perhaps illustrated in Thomas Moffet's satisfaction (1655) in his observation that the area of the London drug market at 'Bucklersberry' escaped the plague when the street was 'wholly replenished with physicke, drugs and spicery, and was daily perfumed in the time of the plague with pounding of spices, melting of gums, and making perfumes'.[5] He felt this resolved the question whether or not sweet odours corrected pestilent air or guided it sooner into the body.

However, generalising from limited observations, perhaps appropriately described as proto-empiricism, was increasingly challenged as inadequate. Thomas Sydenham (1624-1689), in helping to provide rigour to reporting observations in clinical practice, contributed significantly to the need for multiple observations (experiences) made under comparable situations; this included ensuring that observations on the effects of treatment were based on consistent diagnoses bearing in mind the natural history of a disease. He wrote that the 'only true teacher [of physicians is] experience' based upon 'common sense [i.e., observation] and *not* upon speculation'. He also advised one patient to be 'grounded not on opinion, but uninterrupted experience'.[6] I suggest Sydenham's approach may be described as a *level 2* of observational common sense leaving *level 1* to cover generalisations based on a single or a minimal number of observations.

While Sydenham's overall message of careful, methodical observation continued to influence clinicians, a phrase such as Sydenham's 'uninterrupted experience' could also be viewed to include traditional knowledge, i.e. experience accumulated and passed down over time. As Nicholas Culpeper noted (1656) a physician needed to be exposed to 'famous cures, that are divulged by the testimony of the common people'.[7] Such regard for tradition, often embracing criticism of orthodox medical theory, appeared in different guises throughout the eighteenth century, ranging from innumerable almanacs to one of the more influential eighteenth century popular authors of therapeutic advice, John Wesley, the non-physician founder of Methodism. I consider him next, along with a note on another successful popular writer, William Buchan, a University of Edinburgh medical graduate.

Wesley, in his *Primitive Physick* (it reached numerous editions/reprints on both sides of the Atlantic from 1747 onward) wrote: 'I have only consulted herein, experience, common sense, and the common interest of mankind. And supposing they can be cured this easy way, who wou'd desire to use any other?'[8] While he did not clarify the nature or extent of his own clinical experience, or the information taken from his apparently wide medical reading, Wesley did see tradition (hence traditional remedies originating from incidental observations) as possessing a time honoured pedigree that demonstrated effectiveness:

> Tis probable, physick, as well as religion, was in the first ages chiefly traditional: Every Father delivering down to his sons, what he himself in like manner receiv'd.[9]

For Wesley, conformation existed in it being 'the method wherein the Art of Healing is preserv'd among the [aboriginal] Americans to this day'.[10] Wesley also bolstered what might be called his 'common sense empiricism' by attacking medical theory that, he said, had negatively influenced therapeutics. He, himself, had turned away from

> men of learning [who had] set experience aside: to build physick upon hypotheses: to form theories of diseases and their cure, and to substitute these in the place of experiments [i.e. observations].[11]

Further, he indicated that new medicines, introduced by reasoning, speculative men, were 'remote from common observation', difficult to use, and had pushed aside simple remedies that could be prescribed by 'every man of common sense' among whom were the poor.[12] He was in fact criticising the 'common method of compounding and decompounding Medicines [that] can never be reconciled to common sense'.[13] At the same time, based on experience, it made common sense to acknowledge the different constitutions and patterns of living, and

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hence the individuality of patients. Wesley indicated that (i) contrary to common statements, few infallible remedies existed and (ii) one particular medicine would not cure a single person or everyone suffering from the same 'distemper' all the time.[14] In consequence, he offered for each condition a list of remedies. If the first one did not help, then the next was to be tried.

Wesley has not fared well by most commentators; he has been viewed as anti-physician (though he respected physicians who simplified prescriptions[15]) and he is also denounced as a mere purveyor of folk remedies. On the other hand, as noted below, his brand of empiricism, common sense medicine – fitting with levels 1 and 2 of observational common sense – was later seen by others outside the medical establishment as bringing together some fundamentals for medical practice, namely, (i) observation and experience, (ii) simple remedies (many viewed as 'traditional'), and (iii) respect for the non-naturals and natural healing, which I come to below.

The following note on William Buchan, author of *Domestic Medicine,* which has been viewed as the most widely read, non-religious, English book for fifty years following the first edition (1769), is merely to indicate that he reinforced, in a less-dramatic and more considered manner, views and advice similar to Wesley. While less concerned over scholarly learning in medicine, after all he had a formal medical education, Buchan still criticised physicians whose 'ridiculous whims' laid down 'rules inconsistent with reason or common sense'.[16] He added: 'the veil of mystery which still hangs over Medicine, renders it not only a conjectural, but even a suspicious art'.[17] He trumpeted the solution, namely empiricism, in stressing the value of cumulative observations and subsequent inductive reasoning to assess a therapy:

> The united observations of all the ingenious and sensible part of mankind, would do more in a few years toward the improvement of Medicine, than those of the Faculty alone in a great many.[18]

And

> The man who adds one single fact to the stock of medical observations, does more real service to the art, than he who writes a volume in support of some favourite hypothesis.[19]

Moreover, Buchan felt

> it would ... be no difficult matter to prove, that every thing valuable in the practical part of medicine is within the reach of common sense.[20]

Like Wesley, he also extolled simple remedies albeit without Wesley's fervent belief in traditional knowledge and with a proviso:

> We have indeed ventured to recommend some simple remedies in almost every disease; but even these should only be administered by people of better understanding.[21]

'Common sense' theory

Popular health books were generally didactic and eschewed or minimised theory. Nevertheless, a pertinent question is whether 'empirical' treatments had an unacknowledged conceptual basis. While disputes between rationalists and empiricists had existed since classical times, a thoughtful practitioner could appreciate the usefulness of the empirical-rationalist approach so long as the role of theory was not viewed as sacrosanct, but merely as guidance and to prompt critical assessment of the outcomes. In fact, it is hard to see any clinical practice devoid of some guiding concept given the pervasiveness, even into popular culture, of such concepts as humoral theory and two long-standing, closely related concepts, namely the non-naturals and the healing power of Nature.

Both Wesley and Buchan drew on the latter two, along with occasional reference to other prevailing theories. With a long history since classical times, the non-naturals (often referred to as 'rules') focused attention, both as preventive medicine and treatment, on air, food and drink, exercise, passions, sleep and moderate living, etc.[22] Along with the healing power of Nature (commonly referred to as *vis medicatrix naturae*) both were readily viewed as 'common sense,' as proven theories that fitted with Rescher's consensual common sense.[23] Further, they came to be included as fundamentals for medical practice among followers of Wesley, Buchan and other like-minded authors.

The full title to Buchan's *Domestic Medicine* tellingly refers to *regimen* that is the non-naturals **and** to *simple medicines*. He wrote that:

> Regimen seems to have been the chief, if not the only medicine of the more early ages, and, to say the truth, it is the most valuable part of medicine still.[24]

Further, the non-naturals were 'founded in Nature, and [in] every way consistent with reason and common sense','[25] a viewpoint compatible with the thinking of Wesley who, however, also reminded readers of 'that old, unfashionable medicine, prayer'.[26]

On the second concept, the healing power of nature, Buchan was more explicit than Wesley as, for instance, when he wrote that external applications and internal wound medicines

> only promote the cure of wounds so far as they tend to prevent a fever, or to remove any cause that may obstruct or impede the operations of Nature. It is Nature alone that cures wounds.[27]

Despite widespread acceptance of the role of Nature, it was problematic for many physicians, who by no means viewed it as common sense medicine. After all, it implied that they were merely 'the minister and servant of Nature'.[28] At the very least, physicians believed they knew best when to assist Nature, but, perhaps more important, just when to intervene and override it when it was failing.[29] The persistence of physician disagreements and loose usage over common sense is outside the scope of this article.

Common sense and 19th- to early 20th-century health advice

Among an increasing number of health books, capitalising on the nineteenth-century growth in population and literacy, 'common sense' was often invoked to describe, for instance, (1) ways to support the healing power of Nature, and (2) efforts to simplify or

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demystify medicine by offering elementary accounts of anatomy, physiology and, sometimes, chemistry so that readers would be better able (a) to discriminate between sound medical advice, fashion, quackery and unconventional medical practices, and (b) to gain a better understanding of the varied, sometimes conflicting, advice on 'hygiene,' a term that had come to cover, often with adaptations, the non-naturals.[30]

Other books, with questions about conventional medical practices, called upon common sense often rhetorically to bolster an author's point of view. There were, for instance, fleeting references such as it being unwise and imprudent to ignore 'the moral – or rather the common sense inference' of an author's advice on how to maintain a 'clear head'.[31] More striking were book titles that, in also invoking common sense, promoted special interests, some on the fringe of conventional medicine. Three nineteenth-century examples from physicians are:

(i) Edward Bliss Foote's *Medical Common Sense Applied to the Causes, Prevention and Cure of Chronic Diseases and Unhappiness in Marriage*, which was a platform for his free thinking on sexual relations and his promotion of pioneering birth control devices.[32]

(ii) Banning's *Common Sense on Chronic Diseases; or, A Rational Treatise on the Mechanical Cause and Cure of the most Chronic Affections of the Truncal Organs*, which spotlighted poor posture and inappropriate clothing as the cause of a variety of illnesses/disabilities.[33] These were to be managed by Banning's advertised corrective appliances, from spinal supports to uterine elevators.

(iii) Lastly, in the same way, RV Pierce's multi-edition *The People's Common Sense Medical Adviser* was as much a marketing tool as a health manual. Pierce's proprietary remedies were the focus plus, in later editions, his Invalids Hotel and Surgical Institute.[34]

Alongside such entrepreneurial physicians, reform-minded, populist authors – especially among early British followers of the medical botany practices promoted by American Samuel Thomson (1769-1843) – invoked, explicitly or implicitly, Wesley in recognition of his common sense empiricism as fundamental for practice. Echoes of Wesley, Buchan and others exist in the following examples of ringing quotes covering observation and experience, supporting Nature and simple remedies, and challenging conventional medical theory:

a. 'We recommend nothing on theory, but from practical experience'[35] and 'Practical experience has fully established in my mind the great benefits to be derived from using Roots, Barks, Herbs etc., and the necessity of avoiding, as much as possible, Mineral Remedies',[36]

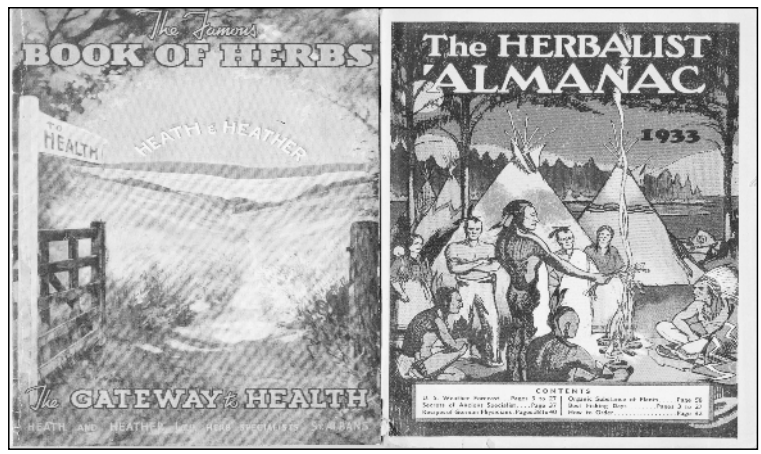
b. 'Nature has a College of her own'[37] and 'the chief aim of the medical botanist should be to assist Nature in exterminating disease and hence act in accordance with her laws'.[38]

c. The 'mystery' and 'false airs of pedantic learning,'[39] and, physicians 'have so mystified and outraged common sense in order to keep the world in ignorance that men have ceased to think for themselves'.[40]

In many respects they fitted with an 1849 quote:

> Empiricism is the protest of common sense against the absurdities to which a blind adherence to the conclusions of theories gives rise.'[41]

Later, and into the twentieth century, others outside mainstream medicine carried the same or similar views. For instance, the varied group of herbalists, who, if not generally viewed as reformers, included major marketing interests that promoted simple remedies and the healing power of nature in a variety of publications (cf. Figs 2a and b). Similar messages, sometimes with a religious orientation (e.g., the purity of nature as God's creation) came from nineteenth-century hydropathists or 'water-cure' doctors, some merging into the late nineteenth- to early twentieth-century practitioners of Nature Cure/Drugless Therapy (also known as Hygienism or Natural Hygiene) that, in turn, became subsumed under the umbrella of Naturopathy. This, at one time, embracing a medley of over twenty different



Figures 2a and b. Small booklets/books and almanacs were commonly issued from around 1900 on both sides of the Atlantic, some from commercial herb companies providing packets of herbs for retail sale. Heath and Heather in England issued many booklets (the rural scene (**2a**) shown is dated 1938) as did the Walpole company with, for example, WA and CWA Browne *Get Back to Nature and Live* (c. 1930). American companies often portrayed Indian usage as in **2b**, from the Indiana Herb Gardens. Typical introductory content included such statements as 'Herbs are the oldest form of medicine. The health and vigor of our earliest ancestors depended largely upon roots and herbs that grow in Mother Nature's Laboratory'. (*The Illinois Herb Co. Almanac 1939*, p. 1). Other favoured phrases were 'Nature's medicine chest', 'safe remedies', the providence of 'Nature', or of *'God'*,

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modalities under the maxim: 'in unity there is strength',[42] echoed such 'messages' as

> If the efficiency of common-sense, natural treatment were more widely known and recognized, how much unnecessary suffering could be avoided.[43]

Summary and comments on the present-day

Hopefully this account has shown that much health advice literature from the seventeenth century onward promoted, initially implicitly and then as a constant refrain, 'common sense' therapeutics. Leaving aside references to demystifying medicine, other appeals to a 'reasonable person,' and unabashed rhetoric to support an author's view, various common sense messages can generally be fitted into my adapted Rescher's classification, but especially *observational common sense*, either as level 1 (based on limited observations, even testimonials) or level 2 (based on a series of careful observations of treatments used under similar conditions). Certain concepts such as the healing power of nature vacillate between *judgmental* and *conceptual*, depending on general attitudes of the time.

Today, the promotion of herbal remedies and of other complementary/alternative practices (sometimes in the form of testimonials and/or rhetoric) often follows the lineage of Wesley in promoting simple remedies, the pedigree of tradition, respect for Nature and the wisdom of God.[44] However, evidence for tradition is very often less than robust as reflected in the hodge podge of small booklets extolling the 'old ways' (cf., **Box 2**).

Box 2. A pedigree of tradition? Titles of recent books/pamphlets extolling old ways

Old Ways Rediscovered (1988)
The Old Herb Doctor (1984)
Indian Doctor. Nature's Method of Curing and Preventing Disease According to the Indians (n.d)
Herbs and Traditional herbal Remedies.
Non-drug alternatives to conventional medicines (n.d.)

I suggested at the start that an appreciation of the ways and extent common sense has been used in the advice literature may help today's health care professionals in their discussions with patients especially those who ask about natural remedies. Leaving aside the ideal, namely that practitioners possess detailed knowledge of the product under question and of a patient's condition, it is of course important to reflect on ways to avoid appearing judgmental, as likely happens if, say, a 'natural' treatment is dismissed out of hand. I suggest it is always useful to reflect on one's own predisposition, whether one is more akin to a **rationalist** (that is largely guided by the pathophysiology of the diagnosed condition) or an **empiricist** (guided more by experiences with patients exhibiting the same pattern of symptoms). Is an empiricist likely to be more open to discuss with a patient/client, even tentatively, say a 'trial' (n = 1) of an 'unscientific' treatment, if it be safe – a nod to personalised medicine?

I suggest, too, that the art of patient-centred care lies, at least in part, in appreciating long-standing beliefs/attitudes that, while at times lying fallow are embedded in society's cultural stock of knowledge, its cultural background, always there to be precipitated to the fore. Hopefully, I have given a sense, with regards to common sense, that it embraces a 'package' of beliefs in the goodness of nature and of simple remedies, beliefs that have been reasserted over the past half century for a variety of reasons ranging from, for example, concerns over pollution of the environment to fears of the side-effects of today's 'chemical' remedies underpinned by ambivalence, if not scepticism, toward science.

In recognising this, is it reasonable to suspect these beliefs are held, to a greater or lesser degree, by anyone interested in a natural remedy? If so, such an appreciation may help to open a dialogue that leads to a treatment regimen that is acceptable both to one's professional ethic and patient satisfaction.

Further, might I suggest, it may well be helpful to explore such matters with students as part of education on self-care advice, as an example where teasing out threads in the history of pharmacy/therapeutics may be recognised by sceptical students as relevant to providing quality patient-centred care?

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Endnotes and References

1. Adapted from a talk to the BSHP Annual Conference, Reading, 1-3 April 2016, with its main theme of education.
2. Various dictionaries, especially *Oxford English Dictionary* (online), for older meanings.
3. For outline to Rescher's classification and other philosophers' views: Ledwig M. *Common Sense: Its History, Method, and Applicability*. New York: Lang, 2006: 2 et seq.
4. Vaughan W. *Directions for Health*. London: Bradocke, 1600: 66. He added, 'It is an absurd thing, to be ignorant in that which everie man knoweth.' Although the specific wording was omitted from later editions of the book, the association remained implicit. Testimonials in manuscript recipe books of the time often offer a sense of personal observation, sometimes justifying the Latin tag *probatum est*. That observations were viewed as proof has been noted by historians; recently, for example, LeJacq SS. The Bounds of Domestic Healing: Medical Recipes, Storytelling, and Surgery in Early Modern England. *Soc Hist Med* 2013; 26: 451-468. A widespread appreciation of the *post hoc ergo propter hoc* fallacy was emerging only slowly. That is not to say common sense was not used in backing opinions that a reasonable person was expected to have. For instance, Cotta J. in 1612 (*A Short Discoverie for Several Sorts of Ignorant and Unconsiderate Practicers of Physicke in England*. London: Jones and Boyle, A3r) wrote that not using a regular physician darkened and extinguished the 'light of common sense'.
5. Muffett [sometimes Moffet] T. *Healths Improvement or Rules Comprising and Discovering the Nature, Method and Manner of Preparing all sorts of Food used in this Nation Corrected and Enlarged by Christopher Bennett*. London: Newcomb, 1655: 26.

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6. Latham RG. *The Works of Thomas Sydenham.* London: Sydenham Society, 1850 (vol. 2): 12 for first quote. Second: Sydenham to John Locke in Dewhurst K. *Dr. Thomas Sydenham (1624-1689). His Life and Original Writings*. London: Wellcome Historical Medical Library, 1966: 167. Sydenham undoubtedly capitalised on seventeenth century trends to evaluate empiricism, in part stemming from the writings of Francis Bacon, but there were many telling comments from elsewhere; for instance, that 'defects' in observations being a reason why 'so many prescriptions we meet with in the works of the most learned practitioners, fall often short in performing the cures they promise': Hall J. *Select Observations on English Bodies: or, Cures both Empericall and Historicall, Put into English by James Cooke*. London: Sherley, 1657: A6r.

7. For some context to intellectual struggles within medicine over empiricism, Zelle C. Experiment, Observation, Self-Observation. Empiricism and the Reasonable Physician of the Early Enlightenment. *Early Science & Medicine*. 2013, xviii (4-5): 453-470.

8. Prevost J. *Medicaments for the Poor, or Physick for the Common People* (translated and added to by N Culpeper). London: Cole, 1656: B3r-v.

9. For a typical almanac, one promoting the astrology of Nicholas Culpeper, *The Family Almanack for the Year of Our Lord 1745*. London: Woodfall, cf. p. 18

10. Quote: Anon [Wesley J.] *Primitive Physick: or*, *an Easy and Natural Method of Curing Most Diseases*. London: Trye, 1747: xiv (first edition).

11. Ibid, vi. And quoting from the 1755 (5th ed.): vii-viii: 'ancient men, having a little experience, joined with common sense and common humanity, cured both themselves and their neighbours of most of the distempers to which every nation was subject'.

12. Reference 10, 1747: vi; for sense of incidental observations, p. viii.

13. Ibid: ix-x.

14. Ibid: for quotes: x and xiii..

15. Ibid: xvi

16. Ibid: xvii-xviii.

17. For an exception to critical attitudes, Madden D. *'A Cheap, Safe and Natural Medicine.' Religion, Medicine and Culture in John Wesley's Primitive Physic*. Amsterdam: Rodopi, 2007. Physicians Wesley acknowledged: 'The great and good Dr. Sydenham' and his pupil Dr. Dover 'who has pointed out simple medicines' and *'in the writings of the learn'd and ingenious Dr. Cheyne.*' (Reference 9, 1747: xiii). Various writers have drawn attention to the authorities that influenced Wesley`s empirical mindset, most recently, Madden, p.116. Also of significance on Wesley not only spiritually, but also with regards to simplifying therapy were reform minded Pietest protestants. For background to Pietist physicians, Toellner R (ed.) *Die Geburt einer sanften Medizin.* Halle: Stiftungen zu Halle, 2004.

Wesley was in tune with the general eighteenth-century trend to simplify prescriptions, and discarded many long-standing remedies linked to, for instance, increasingly methodical approaches to observations, chemical and proto-pharmacological experiments on drugs, and concerns over assessing the active ingredients in a multi-ingredient medicine.

18. Rosenberg CE. Medical text and social context: Explaining William Buchan's Domestic Medicine. In *Explaining Epidemics and Other Studies in the History of Medicine*. Cambridge: Cambridge University Press, 1992: 33-56.

19. *Domestic Medicine: or, a Treatise on the Prevention and Cure of Diseases by Regimen and Simple Medicines*. London: Strahan, 1772: xxviii (the second enlarged edition). For general review of Buchan's book, Lawrence CJ. William Buchan: Medicine Laid Open. *Med Hist* 1975: 19: 20-35. Lawrence makes clear that Buchan may have had a co-author, William Smellie.

20. Buchan, reference 19, 1772: xx. At the same time, Buchan was at pains to state that not all physicians were tarred with the same brush: that the practices of some who 'do much good' were founded on 'good sense and observation, assisted by a little medical reading'. This was compared with those who dosed patients 'with medicine, according to the rules of art [but neglecting] other things of far greater importance'. Ibid, p. xxx.

21. Reference 19: xx. While Buchan did not refer to American Indians, as did Wesley, he noted the role of *'*ancient physicians*'* and their ability to make careful observations *(*ibid., p. x*)*.

22. Reference 19: xxi. Buchan, born later than Wesley, was in tune with the growing emphasis on multiple observations that led to the emergence in the second half of the 1800s of what has been called arithmetic medicine. Cf. Tröhler U. *Quantification in British Medicine and Surgery 1750-1830 with special reference to its introduction to therapeutics*. PhD Thesis, University College London, 1978. Moreover, as a full-time physician, Buchan was more immediately aware of current developments and questions. Robert James, for one, had puzzled why a physician should use a medicine for 'six months' without resolving disputes over effectiveness, as in the cases of Venice Treacle or Diascordium of Fracastorius (James R. *Pharmacopoeia Universalis, or a New Universal Dispensatory*. London: Hodges, 1747: 1.

23. Reference 19: xv.

24. *Domestic Medicine*. Edinburgh: Balfour, 1769: xii.

25. Wesley described the non-naturals as 'a few plain, easy Rules, chiefly transcribed from Dr. Cheyne', while, unsurprisingly, he put aside Cheyne's 'philosophical account and reasons' behind them (Reference 9, 1747: xix). For G Cheyne, *An Essay on Health and Long Life.* London: Strahan, 1725, p. xii.. For Cheyne's influence on Wesley: Shuttleton D. Methodism and Dr. George Cheyne's More Enlightened Principles' in Porter R (ed.) *Medicine in the Enlightenment*. Amsterdam: Rodopi, 1995: 316-35.

26. Various historians have linked the healing power of nature with common sense, for example, Roy Porter noted it is a 'common sense recognition of the self-limiting nature of ailments'. (*Disease, Medicine and Society in England 1550-1860*. Cambridge: CUP, 1993: 20.) For a valuable indicator of the long history of the concept of the healing power of nature: M. Neuburger (trans. LJ Boyd). *The Doctrine of the Healing Power of Nature.* New York, 1932.

27. Reference 24, 1769: xii.

28. Reference 19, 1772: x.

29. Quote on prayer: *Primitive Physick: or an Easy and Natural Method of Curing Most Diseases*. Bristol: Woodfall, 1750, p. xvii. Wesley's writings as a whole also made clear a moral obligation to follow the rules. Cf., also Madden (Reference 17): 155 et seq.

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30. Reference 19, 1772: 703. Others, in also invoking the healing power of nature, questioned the need to prevent fevers.
31. The issue had been raised long before the eighteenth century: e.g. GW enlarged by AT. *A Rich Storehouse or Treasurie for the Diseased*. London: Badger, 1631, A3r for quote. Particular concern existed among university-educated physicians who monitored their own clinical experiences with those of others through their education from teachers and books. They felt their status was diminished, especially if they were seen as no different from empirics, a term commonly applied to quacks. Opposition continued and continues. For one aspect of the nineteenth century: one account of challenges to the concept of the healing power of Nature: Warner JH. 'The Nature Trusting Heresy' American Physicians and the Concept of the Healing Power of Nature. *Perspectives Amer Hist* 1977-78; 11: 291-324.
32. Typical of the views; Primrose [Primerose] J. *Popular Errors or the Errors of the People in Physick.* London: Bourne, 1651: 47, noted that learning was necessary in order to make sense of experiences.
33. As an example of loose usage, see William Hawes' attack on Wesley in 1780, invoked conflicting 'common sense' views. Perhaps surprising for the time, Hawes seemingly only offered his own observations, that is observational common sense, rather than quantitative data. For instance, 'Mr. W., in contradiction to common experience, and common sense, advises his vomit to be given an hour after the cold fit begins,' and 'Recent experience has convinced me that Saffron may be exhibited in larger doses that Mr. W. prescribes.' (Hawes W. *An Examination of the Rev. Mr. John Wesley's Primitive Physic*. London: author, 1780: 14 & 15.)
34. For example of promotion of the healing power of Nature: Combe A. *A Treatise on the Physiological and Moral Management of Infancy,* 2nd edn. Edinburgh: Maclachlan Stewart, 1841: 5: 'The common-sense mode of proceeding [based on careful observation of an individual's characteristics] is so differently adhered to, in practice, that, instead of invariably consulting Nature as the highest authority, we often neglect her dictates altogether, and prefer the mere opinion of the first adviser whom chance throws in our way.' (Combe did not use this book to promote his well-known interest in phrenology, nor in another popular health advice manual, *The Principles of Physiology Applied to the Preservation of Health and the Improvement of Physical and Mental Education*. New York: Harper Bros, 1834.)
For examples on discriminating between sound and false medical advice: Capron G & Black DB. *Popular Medicine or the American Family Physician*. New York: Ray & Brother, 1854: iii: 'It is hoped and believed that the general dissemination of physiological and medical science will have the effect to put the public on their guard against the ignorant pretender and the designing imposter'; and on a better understanding of hygiene: Greene CA. *The Art of Keeping Well, or Common Sense Hygiene for Adults and Children.* New York: Dodd Mead 1906, an adapted version of the non-naturals as it emphasised (p. viii) new scientific knowledge: 'The mistake of the world is to place fancy, feeling and self-gratification in place of real fact.'
35. Granville Mortimer J. *The Secret of a Clear Head*. London: Hardwicke, 1879: 28.
36. Foote's book appeared in various editions with shifts in title, but all referring to common sense. Foote's opening comment in *Medical Common Sense: applied to the Causes, Prevention and Cure of Chronic Diseases and Unhappiness in Marriage.* New York: Author, 1864: iii (Preface) – 'Common sense, I am aware, is quoted at a discount by the medical profession' – set the stage for various critiques of the medical profession. (For some background, Cirillo VJ. Edward Bliss Foote: Pioneer Advocate of Birth Control, *Bull Hist Med* 1973; 47(5): 471-90.
37. Banning wrote : 'It is my desire, by addressing their [the fundamental laws of life] common sense only, to show them how healthy functions are produced and perpetuated', Banning, FP. *Common Sense on Chronic Diseases; or, A Rational Treatise on the Mechanical Cause and Cure of the most Chronic Affections of the Truncal Organs of both Male and Female Systems*. New York: Cady and Burgess, 1848: 12.
38. Pierce, in his many editions of *The People's Common Sense Medical Adviser* (e.g., New York: Buffalo, p. x) hoped that his candid and earnest explanations and suggestions 'on all topics relating to health [would] appeal to the common sense' of readers. He added: 'My object is to inculcate the facts of science rather than the theories of philosophy.'
39. As an example invoking Wesley, John Stevens, *Medical Reform, or Physiology and Botanic Practice for the People*. London: Whitaker, 1847, p. viii, (reference to Wesley's pedigree of tradition with his example of the 'American Indians').
40. Fox W, Nadin J. *The Working Man's Family Botanic Guide; or Every Man his own Doctor*, Sheffield: Dawsons, 1852: iii.
41. Gunn JC. *Gunn's New Family Physician, or, Home Book of Health*. Cincinnati: Moore, 1869: 788. Although designated the 'Hundredth edition', the *New Family Physician* was a vastly different volume from Gunn's *Domestic Medicine or Poor Man's Friend* first edition 1830. By the 4th edition (3rd edition not seen), the title page noted that the plan of the book reduced the practice of medicine to the 'plain common sense'. In part this was taking out the 'technical and bombastic language'. (*Gunn's Domestic Medicine*, Knoxville: Heiskell, 1833: p. 77.)
42. Coffin AI. *Botanic Guide to Health and the Natural Pathology of Disease*. London: author, n.d. (40th Edn, 1866): xv.
43. Coffin AI. *Medical Botany: A Course of Lectures*. London: Ford, n.d., (c. 1850): p. 74.
44. Stevens G. *The People's Guide to the New Botanic Treatment of Disease: A Handbook of Domestic Medicine*. London: Kempster, 1881, p. xv.
45. Coffin AI. *Botanic Guide to Health and the Natural Pathology of Disease*, 36th edn. London: author, 1866: xxiv.
46. Hun T. *Medical Systems, Medical Science and Empiricism. Introductory Lecture*. Albany: Munsell, 1849: 25-26.
47. For quote: Lust B. *Universal Naturopathic Encyclopedia Directory 1918-19,* vol. 1. Butler, NJ: Bernard Lust: 9.
48. Quote, Lindlahr H. *Nature Cure Philosophy & Practice Based on the Unity of Disease and Cure*. Chicago: Nature Cure Publishing, 1914: 124. Common sense also appeared in titles, e.g., Lukis JH. *The Common-Sense of the Water Cure*. London: Hardwicke, 1862. For British background, Brown PS. Nineteenth-century American Health Reformers and the early Nature Cure Movement in Britain. *Med Hist* 1988; 32(2):174-194.

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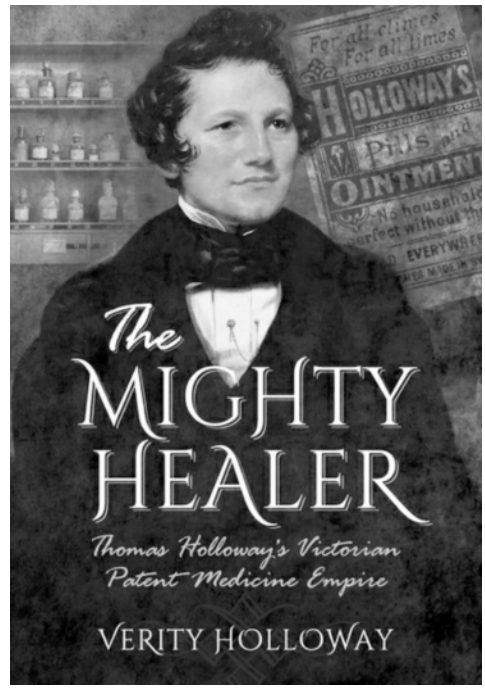
49. Often supported by such biblical quotes as 'Herb[s] for the service of man' (*Psalms* 104:14-15).
50. For useful discussion that also points out the long history of rationalism versus empiricism, Newton W. Rationalism and Empiricism in Modern medicine? *Law and Contemporary Problems* 2001; 64(4):299-316.

Book review

The Mighty Healer. Thomas Holloway's Victorian Patent Medicine Empire.

By Verity Holloway

Barnsley: Pen & Sword Books, 2016, 256 pp, paperback, ; ISBN 1473855675, Price £12.00 plus p&p. Also as ebook.



Verity Holloway is the first cousin, five times removed, of Thomas Holloway of Pills and Ointment Fame. Her book exploring the life, work and times of her ancestor is a really good read. Its combination of a comprehensive biography with some excellent contextual sections provides the wider story that has previously been abbreviated in short articles or chapters on Holloway and individual aspects of his life. Alongside the expected topics of quack medicines and of women's education, the author also explores related themes such as the Victorian approach to mental health care, and even the fascination with Arctic exploration in the nineteenth century. All aspects of Thomas Holloway's business, preoccupations and achievements are successfully puts into context.

The author also provides a full account of Holloway's life, including more detail about his relationships with his family, and with the quack Felix Albinolo, than have appeared in earlier publications. His rivalry and subsequent estrangement from his brother Henry are dealt with in depth, as is his relationship with his wife Jane. As a result, the reader is able to build up a picture of the man rather than just the business and medicines.

The later chapters are of particular interest to anyone who has visited Royal Holloway College (perhaps on BSHP's summer outing in 2015?), especially the section on Holloway's art purchases which the author suggests may have been a means of expressing his grief at his wife's sudden death. In light of the take-over of Holloway's business by Beechams in 1931, the interesting comparison of the two men and their approaches to the medicines business is also very well constructed.

The illustrations include a good range of images, including some from the author's personal collection. It would have been fantastic to have included some colour inside the publication to make full use of some of the advertising material in particular, but at the very reasonable RRP of £14.99, it is not a surprise that the illustrations are black and white.

The book might have benefited from some input from pharmacy historians at a couple of points. Description of pill making (p.57) isn't quite correct – by the 19th century, Holloway would probably have been making his pills using a pill machine rather than a simple tile, and would be very unlikely to coat them in sugar, more likely talc. It was interesting to learn that Holloway had persuaded the PSGB Museum (not yet Royal in 1867 as it is erroneously named in the book) to hand out fliers to visitors (p.75). In this instance, and at a number of times through the book, it would be illuminating to know the source of the information. Following the publisher's house style, the publication does not have footnotes or references, instead relying on a short selective bibliography which might be frustrating for those wanting to follow up on any of the research avenues.

However, this shouldn't deter those interested in Thomas Holloway the man, Holloway's Pills or Ointment, or any other aspect of his activities from taking this opportunity to immerse themselves in his life and times.

Briony Hudson

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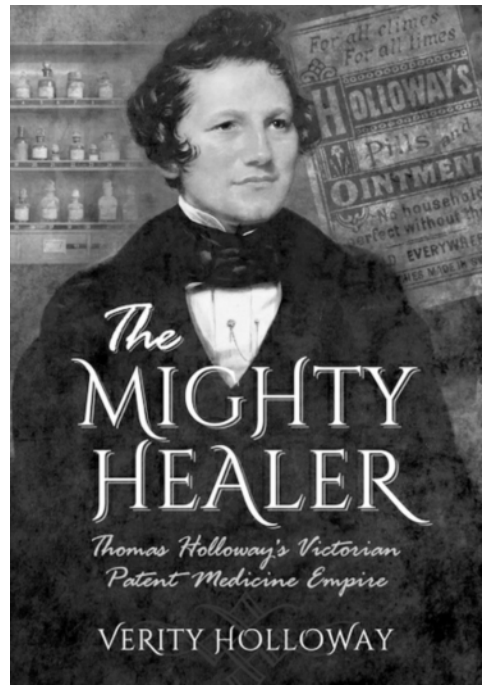

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